THE OPTICAL MAGIC LANTERN JOURNAL
AND PHOTOGRAPHIC ENLARGER.
EDITED BY J. HAY TAYLOR.
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NOTICES:

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NOTES.

Our Annual.—This is now almost ready and will be published within a few days of this number of the journal. A list of some of the contents will be found in our advertising pages.

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Slides of the Norfolk Broads.—The Great Eastern Railway has lately had prepared for them a number of sets of lantern slides to illustrate the beauties of the vicinity of the Norfolk Broads. On application these slides together with a reading can be obtained on loan. Not only will the company lend the slides but for any large gathering they will also supply the services of a special lecturer.

◆ ◆ ◆

Acetylene Gas at Dunedin.—A case in connection with the protection of certain patent rights for the manufacture and sale of calcium carbide is before the Courts at Dunedin. In the meantime an order to keep accounts has been agreed to, and the trial will come off in due course.

Cinematograph in the North.—Messrs. Walker & Co., of Aberdeen, have lately been giving some extensive exhibitions with the cinematograph and are drawing large audiences in each town they visit.

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Oxygenated Beverages.—Instead of aërating certain drinks with carbonic acid gas, as formerly, a factory in Germany is now making a special feature of aërating beverages with oxygen gas. This, it is claimed, assists digestion, and acts as a curative in certain diseases of the respiratory and other organs. The oxygen is produced by an apparatus invented by Herr Bartlett, of Frankfort-on-Maine. We do not know the technical name by which the new beverage is to be known, but presume the sentence "Two Scotches and a small oxy split" would sound all right.

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Cinematographic Jubilee Procession at Bombay.—By the 20th of August cinematographic slides of the Diamond Jubilee Procession had reached Bombay and were on that evening exhibited there for the first time. As far as can be learned from local papers it could not be termed a success, and that "either the light used or the focus of the instrument need to be adjusted before the exhibition can be pronounced a complete success."

◆ ◆ ◆

Photographic Exhibition at Ashton-under-Lyne.—The Third Triennial Exhibition of the Photographic Society of this town has been arranged to be held at the Town Hall from the 22nd to the 27th of November. The hall has recently been redecorated and lighted with electricity. All exhibits must be addressed and sent in not later than the 19th November to the Secretary of Photographic Society, Town Hall, Ashton-under-Lyne.

◆ ◆ ◆

The Pamphengos Lanterns.—Mr. W. C. Hughes, the patentee and maker of the Pamphengos lanterns has added several improvements to them this season, and at the same time has considerably reduced their price. The average reduction is about two pounds on each particular make.

◆ ◆ ◆

Transparent Swiss Film.—Mr. Archibald Rider, who for many years was Secretary to the Eastman Photographic Materials Company, has gone into business on his own account and has fitted up developing and other rooms at 83, Mortimer Street, Regent Street, W., where he is prepared to undertake developing and printing with promptitude. He has also been appointed agent for Dr. J. W. Smith's transparent Swiss films for cinematographs. These films are of two kinds—for negatives and for transparencies.

◆ ◆ ◆

Sun Camera Company, Ltd.—This company has now been incorporated with the firm of Lonsdale Brothers, of Leeds and London, and all communications should be addressed either to 40, New Briggate, Leeds, or 22, Goswell Road, London.

◆ ◆

The Paris Fire.—A few weeks ago sentences were pronounced on the President of the Charity Bazaar and the two cinematograph operators who were responsible for pouring ether into a saturator near a naked light, the result of which was the well-known disastrous fire. The President, Baron Mackau, was mulcted in a fine of 500 francs, and Messrs. Bellac and Bagrachow, respectively, a fine of 300 francs and 12 months' imprisonment; and a fine of 200 francs and 8 months' imprisonment. All the accused were, however, given the benefit of the Berenger First Offenders Act.

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Spring Photographic Exhibitions.—An exhibition is being arranged for next Spring to be held at Portman Rooms, Baker Street, W., under the auspices of the National Photographic and Allied Trades Exhibition Committee. An important exhibition is also promised at the Crystal Palace.

◆ ◆ ◆

Moss's New Acetylene Jet.—Mr. F. Brown, of 13, Gate Street, W.C., has acquired the patent rights of this new jet, the burners of which are controlled independently. He will shortly place it upon the market.

◆ ◆ ◆

Where Colours Come From.—To those who about this time of the year have the opportunity of inspecting coloured lantern slides and other pictures, the following notes will doubtless prove of interest:—A variety of rich tints are obtained from tar refuse, and the cochineal insects also furnish a great variety of fine colours, including carmine, scarlet, etc. Sepia is obtained from the inky discharge given off by cuttlefish; certain yellows are obtained from the camel; ivory black is obtained from ivory chips; Prussian blue is the result of horses' hoofs having undergone certain chemical treatment; the charcoal from the vine stalk gives blue-black, and the madder plant supplies what is known as Turkey red. From Siam we get gamboge which is the sap of a certain tree; raw sienna and burnt umber are certain earths which have been burned.

Colonial Lanternists.

THE perusal of a number of letters from the Southern Colonies, reminds us of the fact that there is a vast field open for obtaining customers in connection with substantial and light lanterns, and apparatus pertaining thereto. In many of the smaller towns there is no gas supply, and the usual illuminant that has to be resorted to for lanterns is the oil lamp. This, alone, is suggestive of a small disc and a single lantern; and such is not calculated to impress an audience with the grandeur with which pictures can under more favourable conditions be projected on the screen.

Here, in England, we can send for cylinders of gas, and despatch our apparatus by train, hire our slides, take a cab from the railway station to the hall, and beyond rigging up the apparatus have little trouble. Consequently, it is a somewhat difficult matter to sympathise with our cousins abroad, many of whom have to order apparatus and slides, which they have never seen, from this country, and get perhaps what they do not stand in need of, and also receive broken slides (broken in transit) in great numbers.

There is a good deal of apparatus in some of the Southern Colonies, but for the most part it is old, heavy, and out of date; and this, added to the difficulties of travelling, does not render the pursuit of a lanternist either pleasant or profitable. A reader of this journal in Western Australia, in a letter, says:—"Fancy having to carry your lantern, slides, screen, etc., on your back for nearly a mile with sand almost up to your knees, or else have to pay a high price for a carrier, when one is on his way to help a struggling church or mission of an evening after a day's work." Of course, a good limelight entertainment under such conditions becomes extremely difficult.

In carrying a supply of lantern slides, it does not take a great many pieces of glass 3¼ inches square to become somewhat heavy after carrying them for even one mile, and for this very reason framed effect slides are quite out of the question.

A letter received explains the inconvenience of heavy apparatus. The correspondent says:—"A minister asked me to give a show for him at one of his mission churches, as he was ill. I took his buggy, and he wanted me to take his limelight outfit, including a 15 feet screen, 1 cwt. of iron, pressure boards, bi-unial lantern, and all the usual requirements, a distance of eight miles; but like David of old, I declined, preferring to use an old lantern with oil light. I left my office at 5 p.m., and with a few biscuits in my pocket, I got ready to give 'A Tour in London'—operator and lecturer in one. It was a lovely moonlight night, and at 8 o'clock I only took 10s. at the door, so I set to work to personally canvass, and having eventually taken 30s., proceeded to give a two hours' show."

As we stated, there is a fine field for obtaining customers for lantern apparatus in the colonies, and the energetic dealer, who is prepared to supply a complete and light outfit, will have ample reward. With regard to the apparatus, it should be a light and folding bi-unial, an automatic oxygen generating apparatus, an ether saturator, etc. Respecting the slides, a couple of hundred slides printed on celluloid will weigh little more than a single slide on glass, and one or two sets of cover glasses, hinged together with a mat pasted on one of each set, is all that is required, for a celluloid slide can readily be slipped between them, when it is ready for use.

It might be said there are light lanterns on the market, automatic oxygen generators are obtainable, and plenty of celluloid slides are to be had. True, but when sending thousands of miles to half-a-dozen firms, one has to consider as to whether apparatus ordered from several different firms are adapted to one another; whereas, if a dealer advertised a complete light outfit consisting of everything desirable to commence an entertainment, we feel assured that he would meet with good support, especially from our New Zealand and Australian friends, where there appears to be a good demand but little supply.

Prominent Men in the Lantern World.

No. XII.—Mr. JOHN ANDERTON.

MR. JOHN ANDERTON was born in Birmingham, and has made that town his home, where he is well known and greatly respected. He is prominent among athletes, scientists, journalists, etc.

As a scholar he was greatly envied, for at the Midland Institute he was the winner of every prize obtainable in experimental physics, chemistry, and animal physiology. He also obtained first-class places at the South Kensington Science and Art examinations, and was marked as first-class in acoustics, light and heat, magnetism, electricity, etc. Professor Tyndall, who was the examiner, placed him first among firsts and he became the proud possessor of the National Gold Medal.

While his mind was being thus trained, his body was by no means neglected; in fact, he became a conspicuous athlete and gained the gold medal as the best all-round gymnast. Separate prizes and medals were also won in connection with boxing, running, jumping, etc., and he has also filled the position of President of the Amateur Athletic Association.

Many of the London magazines have from time to time published communications from the pen of Mr. Anderton, who is a constant writer to his local periodicals.

Mr. Anderton is the proprietor of the firm of R. Field & Co., of 142, Suffolk Street, Birmingham, the well-known house of opticians and makers of scientific instruments; he devotes a large proportion of his time to research. The ingenious method of showing stereoscopic pictures on the lantern screen by means of polarised light, as described in the back numbers of this journal, is his invention, and in connection with this he has been eulogised in the press of this country and also in America to a large extent, all of which he well deserves.

Our readers will know of the silver-faced screens for lantern work which have been commented upon in our columns and which yield results of about one hundred per cent. better than any screen hitherto employed. These are due to the research of Mr. Anderton and also Mr. Lewis Wright, and is an appliance which in the future will be in great demand.

Many other scientific novelties are due to the subject of our sketch—such as a pebble tester which shows a bright coloured cross of mica when looked through. If a pebble be held in a slot of the little instrument the colour of the cross changes or disappears, whereas, on the contrary, if a glass be introduced no change in the cross takes place.

He is also the inventor of an optical toy termed the caricaturist, wherein extravagant distortions are produced in objects by means of prisms. Hundreds of grosses of this toy have been sold in this country alone. Some of our readers may know it under the name of the "Grinograph."

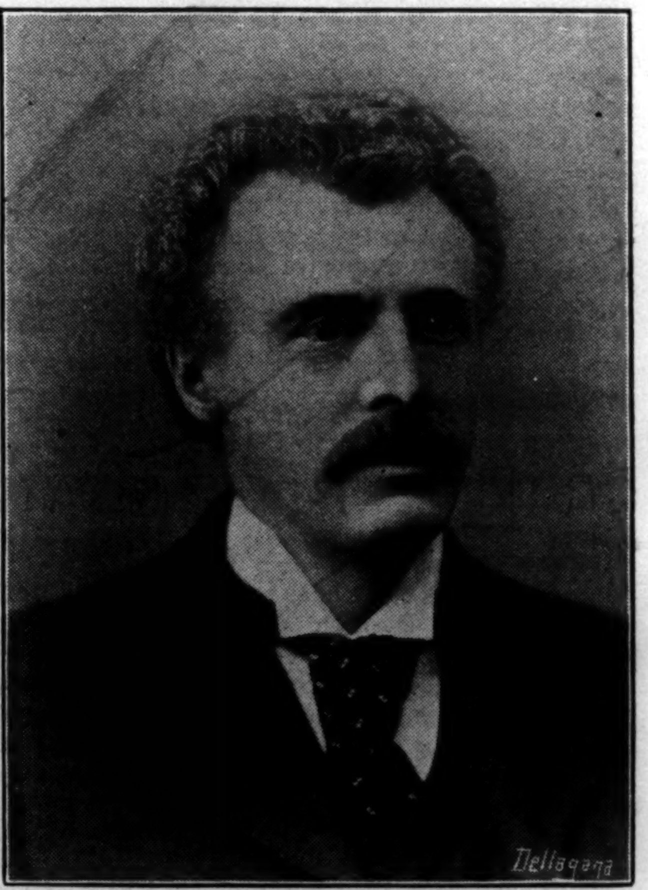


Photo by *Draycott, Birmingham.*

Another great achievement of Mr. Anderton's was that he succeeded in making Colonel F. Weddon's Range Finder, which consists of three prisms, each of which reflects a different angle. The objection raised against the instrument was the stated impossibility of grinding and polishing prisms of the required mathematical accuracy. Further, that one out of many thousands might by chance come right, and in that event the instrument would be worthy of a place in a museum as a scientific curiosity. All the known methods of prism grinding were of no avail, but after thousands of experiments and as many failures, Mr. Anderton devised a method of working which proved so effective that out of a batch of two thousand prism angles tested by the British Government, only two prisms were rejected.

It is a sort of an open secret that Mr. Anderton is, and has been for many years, dramatic critic of one of the oldest and most influential Birmingham papers, and that he has lately completed a comic opera which will be produced during the coming winter. He is also a writer of pantomime and is at present engaged on his tenth pantomime—all the preceding having been performed with great success at the Prince of Wales Theatre.

* * *

*How to Make a Dark-Room Lamp.**

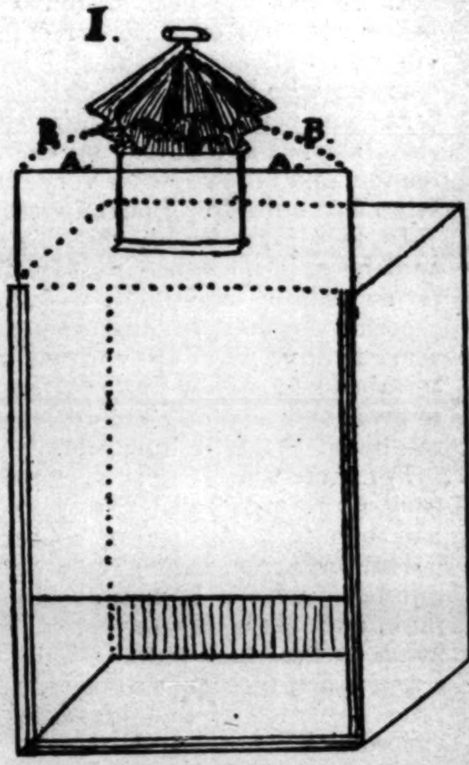
By GEORGE KILBURN.

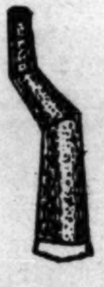
MORE light is what is often required in the dark-room when making lantern slides. This was one of the first lessons which I soon learned when I began making lantern slides. The lamp which I had made for me when commencing photography did not give half enough light for transparency work, so I set to work and made a lamp much larger than the one I had been using.

Having a tin biscuit box, I thought this would make a capital lamp. The size of it is $8\frac{1}{2}$ inches wide, 6 inches deep, and $10\frac{1}{2}$ inches high, with a circular opening in the top $4\frac{3}{4}$ inches in diameter. I got a local tinner to make a cowl for the small sum of 6d. to fit this opening. The opening in the front to take the coloured glass is made as large as possible, say 9 inches by 7 inches. A piece 9 by 7 inches is therefore cut out with a pair of strong scissors or shears. Next fold over three-quarters of an inch, and hammer the fold as flat as possible. This will be required down each side and bottom only, then turn quarter of an inch back again, having a piece of glass or thin board between the folds so as to ensure the sliding coloured medium moving up and down quite easy.

Take the measure for glass required for sliding front and have it cut like piece in drawing A B, and not as shown at A A, and let it project 1 inch higher than height of box in centre to allow for pulling up and putting down. Next obtain some canary medium which costs 2d. per sheet 36 by 26 inches, as sold by Reynolds and Branson, Leeds, and cut a piece of this an eighth of an inch all round less than the piece of glass, and fasten on with any strong mountant. The chimney part can be made either like Figs. 1 or 2. The light can be just as user fancies and either oil or gas can be employed in this form of box. To allow for ventilation make a few holes in bottom of box, and fasten under each corner a small button of wood so as to allow access of air. A good coating of black varnish or lacquer will improve the appearance and also prevents rust.

I.





2.

Should still more light be required, openings in the sides can be made similar to front, only they will not need to slide, but simply fold the edges over on to the glass all round. For those who use isochromatic plates, a good plan is to have an extra front glass of a suitable colour for such plates.

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* Received too late for insertion in ANNUAL.

*The Magic Lantern in New Zealand.**

By W. H. MATHIESON.

I THINK my communication will best interest the lantern public if I give a short description of the outlook of the magic lantern here in New Zealand.

Five years ago we had a visit from the great Snezell, with a magnificent lantern and some dozens of good lecture sets. His outfit was said to be worth £1,000, but this I will not question; however, it must be said that he was the best all-round lantern entertainer who has ever appeared in the colonies. He was well advertised, and had a first-class operator who handled effect slides in a magnificent manner. Snezell himself is a first-class singer, a pleasant speaker, and a good reciter, and always gave a very high-class entertainment, quite free from any trace of vulgarity.

In the large cities he had big and influential audiences, but, strange to say, in the smaller towns was a comparative failure. On one occasion he had a small audience which was very rowdy (not an unusual experience in certain parts of New Zealand), and he proceeded to give them a bit of his mind, when his audience retaliated by half-killing him.

For some time after this we received no visits from lanternists until two years ago, when we had one from an officer connected with the Salvation Army, who gave a very good entertainment with a bi-unial. He used a small tank, and made his oxygen as he went along, using a kerosene stove lamp. He employed a four barrel ether saturator, similar to that used by most of the professionals who have visited and travelled through **New Zealand,** for in many of our small towns there is no gas supply. This lantern lecture was entitled, "Picture, Song, and Story," and was given in aid of the Salvation Army Infirm Officers' fund. From all accounts this lecturer made a good thing of it, as the local branches of the Army worked up his houses for him; thus in a few months' trip he is said to have made about £1,000. Previous to his visit to New Zealand he had been steadily travelling through the other colonies for over two years. He was a most enthusiastic lanternist, and showed some of the very latest effects, but, strange to say, he met his Waterloo in a small country village here, and his beautiful lantern and slides, which were the very idol of his heart, and cost about £500, were completely destroyed by fire. This entertainer was likewise an amateur photographer, and took views of the principal places he visited. A specially fine set which he used to exhibit was of the diggings at Coolgardie, in Western Australia, which at the time he visited New Zealand was all the rage. The pictures of the diggers and their mode of life were particularly realistic.

During the last few months we have had two theatrical companies who have introduced the cinematograph into their programme. I went to see them, but it was unpleasant to watch, as the flicker was very great, and the pictures continually jumped about and got out of focus, although one set—the arrival of the Paris express train—was very effective. However, it is to be presumed that these faults will eventually be removed, and then possibly cinematographic pictures will take the place of the magic lantern.

As I write, there is a **professional company** travelling through the colony with a triple lantern; they give descriptive lectures on England, Scotland, and Ireland, together with appropriate songs and recitations, and I must say the manipulation of the lantern is really first-class. This company term their entertainment the Myriorama.

I had a long conversation with the lantern operator to this company on acetylene gas and kindred matters. He had used acetylene gas, and gave it as his experience that though superior to oil, it could not be compared to limelight; he considered it dangerous, and advised me against its use until its explosive properties were better understood.

Every town of any size here has its lantern operator, who has a good lantern and several sets of slides at the disposal of ministers and others, and nearly every church has what might be termed a toy lantern and a few sets of slides. With these every now and then we have a lantern lecture (?) in aid of some church or other object, and thus a few more shillings are extracted from the long-suffering congregation. I have been to several of these so-called lantern lectures, and the mere recollection of some of them is enough to make one shudder. Can it then be wondered at that the public are—to use a colonial phrase—"full up" of the very name of magic lantern? There are, of course, honourable exceptions to this, but the great majority are as above stated.

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* Received too late for insertion in ANNUAL.

I understand that Snezell is again coming here, and no doubt the recollection of his former visit will ensure even fuller houses than his first trip.

If that great lanternist, Professor B. J. Malden, could be prevailed upon to come here for a trip he would draw splendidly and have large audiences, but there are no people harder to please than a colonial audience, as many actors and lecturers have found out to their cost.

I will now give a word of advice to any professional who is thinking of coming out here. You must be thoroughly up to the times in your profession, and also find a new name for your show, as we have had plenty of myrioramas, panoramas, and a hundred and one other ramas. The people here are looking for something new, and I think it will be on the lines of the Cin., as it is popularly known here.

Should any reader interested in my remarks desire any further information, he may obtain my address from Mr. J. Hay Taylor, the editor of our Optical Magic Lantern Journal.

* * *

The Beechey Trinoptric Lantern.

By CANON ST. VINCENT BEECHEY.

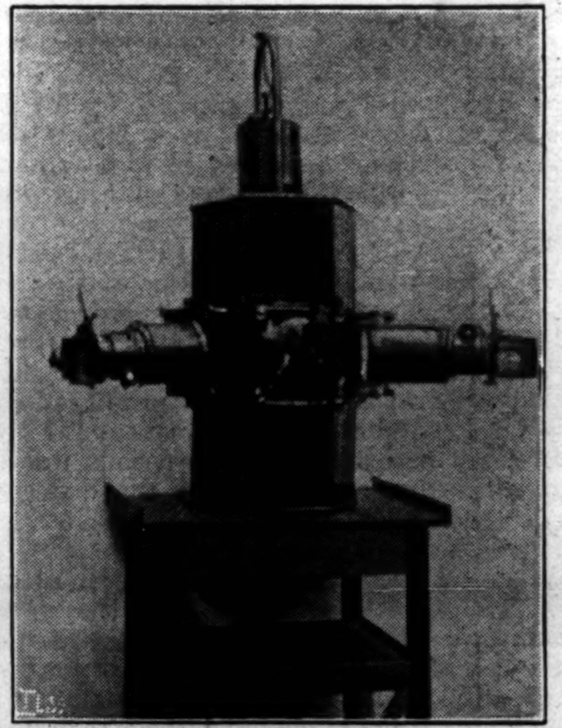
WE have been favoured per Mr. C. Watson, of Holborn, with the following remarks from the Rev. Canon Beechey, Hon. Canon of Manchester.

[Canon Beechey, who is the inventor of this form of lantern, has attained the age of ninety-one years, and we are pleased to say he is hale and hearty. Notwithstanding this great age, he is able to take an occasional run to London, from his home in Norfolk, in the pursuit of science to which he is still an active devotee.—Editor.]

"I little thought to see my old patent lantern brought up again, and I must confess I felt gratified to see a description of it in two numbers of the Optical Magic Lantern Journal. The account of it in the last number is wonderfully correct, with, however, one exception, and that is I never could get a 20 ft. picture, nor in fact any bright one over 10 ft. with the light I then had, and that was the reason I dropped it. I could not get a sufficiently all-round light for the large lantern lectures which I gave in those days gone by, viz., 1847, just fifty years ago.

"I say I was gratified to see this lantern again brought to notice, for strange to say, I have myself just resuscitated it in consequence of having got the electric light in my house, church, and school. I had come across a charming little arc lamp, made by Woodhouse and Rawson, but this Midget lamp is, I fear, no longer made. However, with the lantern and this lamp I get a good all-round light, with 50 volts and 8 to 10 amperes.

"Having met with success in this direction, I have just completed a new electric trinoptric lantern (a photograph of which is reproduced). The front consists of three sides of a hexagon, and the back is square. As the centre nozzle is a little nearer the screen than those at the sides, I use in it a lens of slightly shorter focus in order to compensate for this.



"At the end of the two side objectives there are prisms of eighty degrees angle; these can be moved sideways so as to make the discs move sideways, thus two or even three pictures can either be placed on the screen side by side or central, one on the other, or by the same means a figure or ship in the side stage can be made to pass across the picture projected from the front nozzle.

"Each front is provided with a shutter for dissolving purposes. These shutters, which are placed close to the lens, consist of two plates of brass, one over the other, from which a V shaped piece is cut so that they act after the style of an iris diaphragm, and open and close from the centre of the lens by the movement of a lever.

"With this lantern, and a single light, some very beautiful effects can be produced. I am at work now making a series, and already have a fine eruption of Mount Vesuvius by day and night; the eruption going on as smoke by day and a fearful fiery one by night. I have also ghosts and angels, snow scenes, which are seen to change as the snow descends, etc., etc."

*Lecture on Astronomy.**

By A. R. SCHUTZ.

(Author of "CELESTIAL SYMPHONY.")

SO then our enterprising editor has determined that astronomy shall come down from its high and lofty position, and associate with other interesting topics usually dealt with in the lantern world. A very wise step too, for since no science can be independent, but all branches of learning have need of each other at times, they may as well learn to work hand in hand together in this sphere; and the astronomer is sure to prove a most interesting companion. He has long been regarded as a mysterious isolated being, living on the mountain top under his dome of wood, and speaking a language sometimes hard to understand.

Well, the professional astronomer is perhaps a sort of giant among men, considering the gigantic difficulties he meets in his limitless sphere; and to grapple successfully with all the profound problems astronomy confronts him with, and to be fully qualified for all the refined measurements and calculations, requires not only a very costly preparation, but also a mind of extraordinary powers. Many of the giant tasks have been overcome, and difficulties are so far reduced, that the most simple minded may now read works on astronomy with profit and pleasure. The popular portion of these publications should have a much larger number of readers, since the benefits conferred upon mankind by this science, are perhaps greater and more far-reaching than those of any other.

Here, however, we are not going in for scientific difficulties, but simplicity; the greatest difficulty that may arise will fall to my share while marking out the best course for an astronomical lecture of one and a half hours duration, before an assembly "particularly ignorant of the subject." I have been asked to give a "list of the most interesting slides suitable for such an audience, with a few rough lines explaining detail."

As I have not been informed as to the length and breadth of the lecturer's capacity, I will assume him to be equally unacquainted with this science; then we shall have to start right at the beginning, and my remarks and suggestions may prove all the more useful to those who would entertain or enlighten their friends on these lines. And as I have gained my knowledge by practical experience, I hope to link my explanations together in a way so as to bridge over or hide most of the puzzles usually confronting the beginner in astronomy.

The would-be lecturer must at once grasp the fact that the earth is one among the shining host astronomy has to deal with, and nobody will ever puzzle out the ever-changing aspect of the heavens who does not fully understand the movements and position in space of the little "wandering star" upon which we live.

When sets of slides with **descriptive lectures** were invented, astronomy was not forgotten. The best list of such I find on page 309 in the catalogue of Newton & Co., 3, Fleet Street, E.C. (page 53 old catalogue), where three sets are given. No. 3 set: "Ten Rackwork sliders, 3 inches diameter, packed in box, £7 7s. per set; on hire, 5s. for one evening; lecture, 1s."

This will answer our purpose best, but not in the numerical succession given there, which is very eccentric. I should take them in the following order, No. 1, 4, 10, 2, 9, 6, 7, 8. You may show No. 5 if you like, it is very interesting and amusing. No. 3 you should put away as useless, unless you can handle it scientifically.

The simplicity in which our first slide appears is really not too childish, seeing we can buy a 2s. 6d. volume by a man of some scientific pretentions, preaching the doctrine of a flat earth. And some religious enthusiasts attempt to argue that the Bible teaching does not admit of the rotundity of the earth, declaring that she is fixed. If they come to you Mr. Lecturer, tell them that the Bible says, "He stretcheth out the north over the empty place, and hangeth the earth upon nothing" (Job xxvi., 7), and our picture confirms the fact.

And if the earth is thus suspended—hanging upon nothing—she is free to move, and that she moves is confirmed by the next slide (No. 4), or better, by daily observation. We see that all objects outside of our globe come up from the east, passing over our heads towards the west. This is so, simply because the earth rotates on her axis from west to east, bringing us alternately into the light of the sun and out of it again, producing light and darkness, or day and night. When we are not in the light of the sun, we meet multitudes of stars. If you will mark any one of these stars at any particular point, then you will see it at that point four minutes earlier (about) every succeeding night, two hours earlier every month, and in twelve months, of course, twenty-four hours earlier, or about the same time in the same place where you saw it twelve months ago. This means that either the entire heavens have described a circle, or else the earth must have done so during that time, which should seem more likely.

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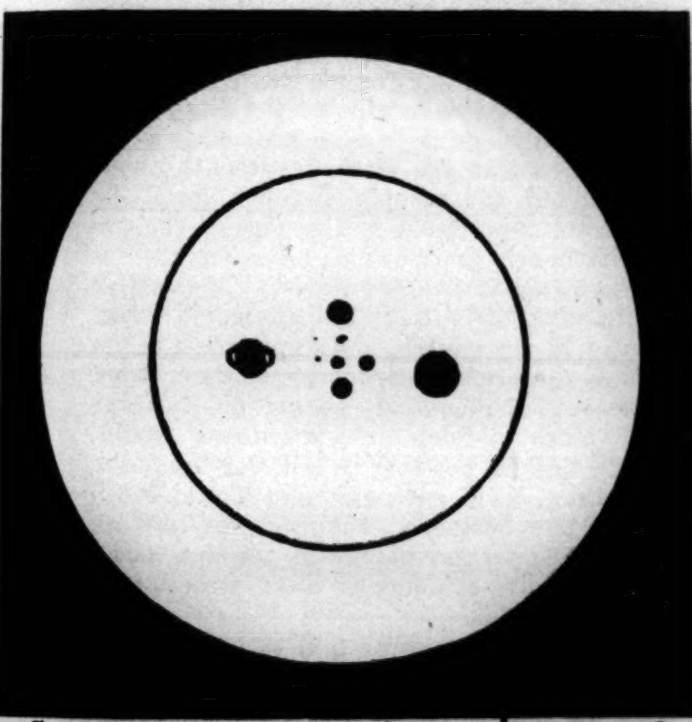
* Received too late for insertion in ANNUAL.



Comparative size of the Sun & the Planets

While our earth thus spins round with us every twenty-four hours, we also encounter another great light, occasionally, our moon, but in a different phase and a different place every time, and later too each time. Following her movements, we shall find her travelling eastward, towards the sun apparently, where we lose sight of her, and find her on the other side in a few days, and at the end of a month she will gain the same position towards the earth as she had at the beginning, but with the earth, she has also passed the stars eastwards. She is evidently a dark body like the earth, half in sunlight, but since we view her always from different angles, we see differing portions of her illuminated surface. This will become more plain in the next picture (No. 10).

Here we are presented with a remarkable phenomenon; the moon seems to possess a sort of magnetic influence, whereby the waters on the earth are drawn upwards into a heap. This heap moves onwards as the earth rolls round, but it must cause an up and down movement in our oceans, and therefore a periodical ebb and flow on their shores! Those who live by the sea (and watch) know that the tides keep time with our moon's movements. It will be noticed that when the moon is on the same side as the sun, the two drawing together—for the sun has a similar influence, but less than the moon—our waters bulge out most, not quite so much at full moon when they are opposed to each other, and least when the moon is in her quarters. Then

earth, sun and moon

form a sort of triangle when their power is neutralised, and so we have the secret of spring and neap-tide, which take place twice every month.

Now, if we examine the position of the sun among the starry hosts, we shall perceive him also throwing the stars behind, travelling to the east, but coming to the same position again every twelve months.

Does that great luminary then also move around the earth? The ancients thought it must be so, but no, that would be against the usual order of propriety. As our earth controls her little moon and swings her round every month, so that mighty sun swings our little earth, with her satellite, around him every year.

See them sailing along now on the sheet (No. 2), accomplishing one journey while the earth turns on her axis 365 times (about), and the moon sails around her a little more than twelve times (not thirteen as your printed lecture has it; the explanation of harvest moon there had better be left out as incorrect, it being most likely a slip on the writer's part).

The movements of earth and moon, as seen in this picture, are real; what we call the rising and setting of sun, moon and stars, are only apparent movements, caused by the earth's daily rotation; and you can also perceive now easily how by her onward journey we must meet the stars earlier week by week, and the sun must seem to be moving backwards among them. If we could possibly stop the earth's movements for awhile—say we stop her at midnight--we should never see the sun; the moon would be present through half of each journey, rising in the west and setting in the east, always at the same point on our horizon; and the stars would never be seen to move at all, except one here and there of those that do not twinkle. Some of these, too, are seen from year to year to shift eastwards; and these are other planets revolving also around our sun, as seen in the following picture (No. 6). Some of them are larger than the earth, some smaller; some have more moons, others have none.

Here we have before us, perhaps, the most marvellous spectacle imaginable. All these ponderous bodies suspended in space, sailing along as easily as though they were swimming in a huge pond, keeping their attendant moons within bounds, while our great sun is evidently invested with the mysterious power of controlling the movements of the entire family of worlds. Although they are so numerous, so large and so far away—Neptune being no less than 2,800 million miles from the sun—they are kept revolving through their mighty course in perfect order. Our telescopes show most of them as rotating on an axis, and having therefore day and night.

If we examine this axial rotation of our earth, it reveals a

masterpiece of design,

and any alteration in the position of that axis would bring confusion, misery and death upon us. Imagine, for instance, if during the earth's revolution, one pole was always turned towards the sun. There would be continual day on one side and night on the other, and life, as we know it, would not be possible. Or if the axle always stood upright, then day and night would be for ever equal all over the earth—as is the case now on 22nd March and September—and we should have no seasons, as the temperature would remain pretty well equal. But our next picture (No. 9) shows us that the earth leans to one side a little; she always keeps in this position, and wherever you find her during her journey around the sun, the axis ever points to the same spot. In this way every portion of the globe's surface is alternately presented to the light and heat of the sun in an ever-varying aspect, causing a regular periodic rise and fall in temperature, and thus summer and winter, seedtime and harvest are perpetuated.

By this time it must have become easy for us to understand how in all these circulatory movements our moon may at times get between us and the sun, cutting off more or less of his light, or that she may also fall in with the earth's shadow and get herself eclipsed. And the interior planets might also sometimes seem to be crossing the face of the sun. These transits and eclipses are nicely illustrated by the two remaining slides No. 7 and No. 8, which pretty well explain themselves.

But doubtless our audience would like to form some idea as to the size of our sun; since we have been informed of its great powers in bringing about such wonderful phenomena, it must be a body of extraordinary dimensions and activity. How would it compare in size if all its family of planets were brought close to it?

We will once more use our imagination and cause our earth to be laid on the centre of the sun's face and the other planets near about her; then we draw a circle about them for the moon to travel on, for there is ample room for them all within the moon's orbit (see the illustration above, such a slide is in the market). From the central dot to the circle represents about 240,000 miles, the moon's distance from the earth; from that circle to the edge of the sun would be nearly another 200,000 miles, for our sun's diameter is 865,000 miles. The earth's diameter is 8,000 miles; Saturn would make 700 balls like our earth, and Jupiter 1,200, yet we should require a telescope to see them from our present distance of about ninety-three million miles. Such an experiment would, however, not be possible at all, for long ere these planets could get near, they would catch fire, melt like butter, be changed into vapour, and absorbed by the flames of the sun, not a shred left to give evidence of the destruction of these great worlds.

The best slide to show first is perhaps the one with a Telescope and Astronomy in large letters, 1s., and conclude with the Planisphere slide, published by Geo. Philip and Son, 32, Fleet Street, E.C. See my remarks in our journal for December 1896, where other useful hints will be found; and if the lecturer should possess my "Celestial Symphony," he would not often want to go hunting elsewhere, if he wished to delight his audience with all that is marvellous and interesting in astronomy.

* * *

ROYAL PHOTOGRAPHIC SOCIETY.—The forty-second annual exhibition opened on Saturday evening, 25th ult., with a soiree, to which a large number of guests were invited. This exhibition was thrown open to the public on the 27th ult., and will so remain till November 13th.

Faces on the Wall-paper.

By S. D. BAIRSTOW, F.L.S.

A COUPLE of thousand feet above sea-level, right atop the noble Zuurberg mountains, is pleasantly ensconced in a little natural basin of kloof and rustic protection the snug sanatorium whose reputation is so widely recognised.

In this picturesque bungalow of life extension are many bedrooms, amongst which mine own, and "I am not so well," to use the proprietor's cheery saying. Curious influenzic pains make of my shrunken frame a pincushion. The bed is soft enough, but feels hard and rugged. The day is bright and sunny, but consoles me not. Sweet birds are twittering love songs amongst eucalyptus and pines, but they cannot enliven my drooping spirits. The dear old pipe does its best to soothe—all to no purpose. I've got the hump, and I am in the blues. . . . . There is a balm for every wound, and, Eureka!

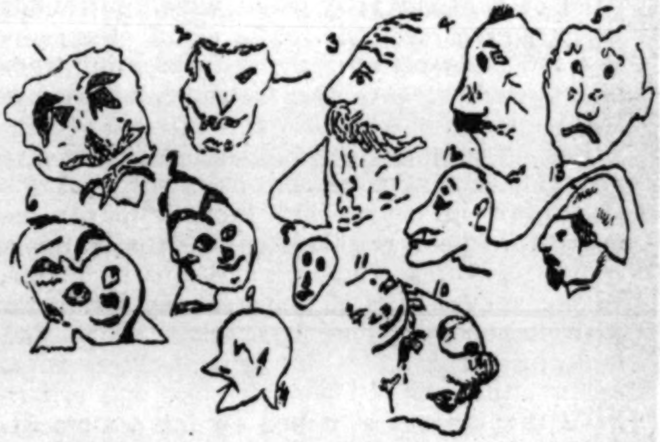
"No bolt launched from Olympus! Lo, their answer at last!" Thus, in the old days when my dear dad could afford a better class of wall-paper than the writer ever hopes to afford, I have spent many a pleasant hour in devising **caricature pictures** and curious statuesque figures, fanciful inventions imagined from wall-paper designs, licked into shape and there and then pencilled in my sketch book. That was, however, long, long ago, but the fit has recurred, and I am impelled to return to those muttons.

Just now my bedroom paper is an insult alike to art and manufacture. It consists of a cheap cottage material bespattered in farcical daubs of floral decoration. Blue represents stems and twigs; yellow and red, the flowers. Yet the *tout ensemble* is not unpleasant. There is a small limit on which to work, but I am doing my best to fancy out a few sketches.

What cheered me may cheer others, and here is the recipe. Glare at your wall-paper until you imagine some face is stowed away betwixt lines and space. You will be sure to find one. Dot it down on paper promptly, either from a clearly defined object or from memory, or both. Both is best, as you are enabled to compare effects of reality and fancy, thus adding to amusement. I claim no invention, for I have oft accredited Gus Doré with the patent, and thought that Phil May owed one or two of his classical "——" to wall-papers. Undeviating original genius is indeed a *rara avis.* My younger friends must not labour too long at their task, for, like those head-racking London puzzles, madness lies that way. With a little practice really good copy may be obtained. Eyes need not always be fully opened. A gentle squint or side gaze is pardonable in altering effects. Adopt any plan you wish to obtain a fair result. I have no desire to expatiate thereupon. Do your best. The thirteen sketches accompanying this were designed in thirty minutes. They are by no means average, my material being limited, as I have explained.

I have only submitted human faces, but there are lots of animals mooching around.

THE OPTICAL MAGIC LANTERN JOURNAL is, on its front page, described as being for the domestic circle; so I presume I may be allowed to make a suggestion for the young folks. Rare fun can be had by setting juveniles to work at an evening party to draw in the manner I have suggested what appears to them on the wall-paper. This having been done, the lantern apparatus comes into play. In some of the back numbers of this journal I have seen illustrations of a slide by which sketches can be copied on smoked glass in the lantern, the copy being placed at one end of the apparatus, when the lines, which are traced over with the pointer, are reproduced in the stage of the lantern, and consequently on the screen. This will afford much more amusement than showing a collection of the funniest comic slides that may be obtained in a commercial manner, and I leave my young readers thus to enjoy themselves.



* * *

THORN & HODDLE.—This firm, at present at 164, Camberwell New Road, are fitting up new premises at New Tothill Street, Victoria Street, S.W., where they intend removing at no distant date.

The Electric Light in the Optical Lantern.—No. VIII.

By CECIL M. HEPWORTH.

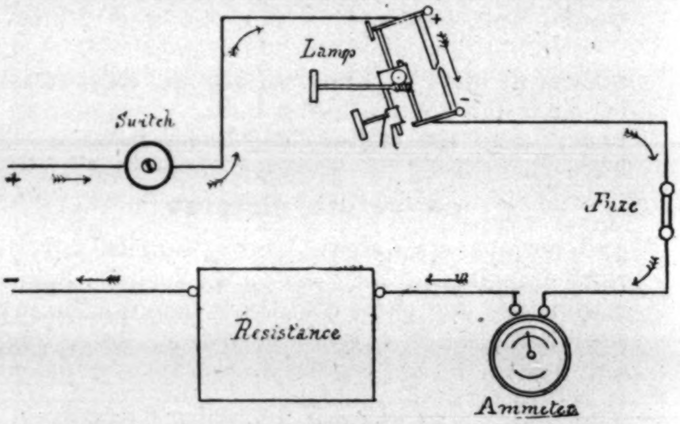
(Continued from page 147.)

A HANDY instrument in the electric lanternist's paraphernalia is a "Pole Indicator." This consists of a glass tube with a metal electrode at either end, and filled with a liquid of very high resistance. This liquid is partially decomposed when a small current passes through it. Normally the liquid is perfectly clear, but under the influence of an electric current a small portion is decomposed and assumes the appearance of a bright ruby cloud which surrounds the negative electrode. The cloud disappears in a few moments after the disturbing influence is removed, so the little instrument is always ready for use.

Let us suppose that the lanternist is to give an exhibition at a certain hall, and that the electrician in charge has brought to a place near to where the lantern has to stand a couple of wires from a point on the mains, whence a current of 15 ampéres may be drawn with impunity. The first thing which the lanternist will do is to attach these wires one to either end of his pole-tester, and ask to have the current switched on for a moment. A second or two will suffice to show the little cloud arising in the tester, and the current can then be switched off again. It has already been said that it is around the **negative pole** in the tester that the ruby cloud collects, and our operator will do well to immediately mark one wire to distinguish it from the other as soon as the test has been made. In my own practice I make it an invariable rule to tie a piece of string around that wire that the test shows to be positive; *i.e.*, the one which is attached to the opposite end of the pole-tester to that at which the red cloud forms. Failing a pole-tester—which is a considerable convenience, but not an absolute necessity—there is another simple way to tell which wire is connected with the positive pole of the dynamo or battery, but it involves connecting up to the lamp and its accessories, and the connections may afterwards have to be reversed, though that is not a very considerable undertaking. Connect up the lamp and resistance in the manner to be immediately explained, and start the light and allow it to burn for a minute or two. An experienced worker will recognise in a moment, from the direction in which the greater quantity of light leaves the carbon points, which of the carbons is in connection with the positive, and which with the negative pole. But the tyro will not possess the same facility. Let him allow the light to burn for, say, two minutes, and then switch it off. Now let him watch the carbon points and observe which will retain its red-heat for the longer period. That one will be the positive carbon, for, as already explained, there is twice the activity at the point of the positive rod as compared with that which obtains at its neighbour's extremity, and therefore, as it soon gets twice as hot, it will naturally take longer to cool.

If, when the above recorded experiment is performed, it be found that the positive "lead" has been connected with the lower carbon, the wires must be reversed in such a manner that the positive electrode is at the top.

And now for the manner in which the connections are to be made. The easiest way to explain this very important matter, which, however, is by no means difficult to understand, is by reference to a diagram. The simple sketch shown herewith will require but little explanation. On the left-hand side are the two leads bringing the 100-volt current up to the lanternist's table, the upper one being of the positive persuasion, as shown by the + sign. This wire is shown first connected to a switch, whence it goes direct to the upper carbon of the lamp. In the other case, that of the negative wire, which is shown lowermost, and distinguished by the negative sign — the lead is connected direct to the necessary resistance by which the voltage of the electricity is reduced to the required extent, and the flow of the current through the lamp controlled. From the resistance the current is conveyed by a short piece of wire through an ammeter, by which its quantity is measured, and from there



to a safety cut-out, or "fuse." Another short piece of wire connects this last with the negative or lower carbon holder of the lamp, and thus completes the circuit with the distant dynamo. Although these various portions of the circuit are shown in the diagram arranged in this particular order, it does not follow that this order must be strictly adhered to. On the contrary, it does not matter in the least what part of the circuit the resistance, or ammeter, or fuse, or switch are placed, so long as the current passes through them *in turn*. But it is most essential that the positive wire be attached to the upper carbon, and the negative to the lower. For the rest, the items can be connected in any part of the circuit, and in any order that happens to be convenient. But it must be remembered that the complete installation must form a circuit with the distant dynamo. The current must pass from any given point *round the circuit* through all the instruments, including its source, the dynamo, in turn, and thus back again to the same point. Let the lanternist at once get the idea of a circle into his mind; a circle which is only broken in order to have a lamp, or resistance, or switch inserted between the broken ends, which ends are thus virtually united again, from an electrical point of view. Of course, this electrical circle, or more properly, circuit, is not of necessity circular in shape or anything like it. That is merely a convenient metaphor with which to convey the general idea.

In another article I propose to briefly call in review one or two little tips and wrinkles that may possibly be of use to the lanternist who aspires to electricity as the source of his illumination, and to point out how certain irregular conditions may be recognised and remedied, after which this series of papers will be brought to a close.

Enlarging on Bromide Paper, etc.

By EDMUND A. ROBINS.

ABOUT this time photographers are beginning to think of putting away their outdoor apparatus until next season and to prepare their pictures for exhibitions and decorative processes. A few words about enlarging upon bromide paper may be useful to those to whom the process is new, and perhaps to those who have already done some. I do not intend to speak about the necessary apparatus required for the work, as with a few tools and a little patience and ingenuity any photographer can knock together the small quantity of apparatus required, and for the details of which I must refer the reader to any modern text-book. The first point to notice is the class of paper to be employed; this will depend upon the operator's artistic ideas and also upon the class of negative, generally. For small prints, say up to 1 by 1, a smooth surface paper such as ordinary bromide or platino-matte is to be recommended; for large sizes the thicker and rougher papers are desirable, both from an artistic and practical point of view, as the risk of tearing in the thicker paper is greatly minimised. Taking say Eastman's bromide paper as an example, the A and B papers are suitable for small prints and the C paper for the larger sizes, these papers being coated both in extra-rapid bromide paper and platino-matte, which is also made in two kinds giving soft and hard results, with a platinotype-like surface. It will be seen by this that a great variety of effects can be produced, specially if toning be resorted to, as I shall direct below. The exposure of course varies with the negative light and stop used, but "blue" negatives require less exposure than "yellow," and it is always best to test the exposure by means of a small strip of paper exposed for varying times to the enlargement.

Many enlargements can be vastly improved by judicious shading of the thinner portions, such as the face and deep shadows, by means of a piece of cardboard—portions can be printed up by using a piece of card with a hole in it such as a vignette; above all, be careful not to over-expose else flat results can be expected. The ferrous oxalate developer can be used but is not recommended, for the slightest trace of hypo or pyro will cause black stains; the developer I can recommend is as follows:—

Amidol	60 grains.
Sodium sulphite ..	1½ ounces.
Water	20 ,,

If the above acts too rapidly, dilute with water; to increase the contrast add a drop of 10 per cent. potassium bromide, too much bromide must be avoided as it is very active. When developed the print is well rinsed and fixed in hypo 4 ounces, water 20 ounces; no acid clearing bath is required, thus giving one great advantage over iron development. In the fixing bath the contrasts appear to increase, and therefore it is not advisable to develop too dark, as the prints always appear darker when dry.

After fixation is complete, generally in about 15 minutes, the prints are washed, with the usual precautions. After washing it is advisable to give a bath of alum, about 1 ounce alum to 30 of water, and again rinsing before drying. If a glazed surface be required, the print, which is upon ordinary bromide paper and not matte surfaced, is squeezed upon a sheet of ferrotype iron which has been well waxed, with a solution of bees wax in benzole, and well polished off, or else upon a sheet of plate-glass, free from scratches, which has been waxed, or else dusted over with French chalk (powdered talc), and polished with a soft cloth. To preserve the glazed surface on mounting, a backing paper must be attached to the back while the print is damp and upon the glass, the two drying and coming off together; the print may then be mounted without injuring the gloss. Care must be taken not to strip before the prints are absolutely dry, as they will not leave the plate. The Eastman Company have introduced a species of bromide paper having a very fine surface, it is known as "Nikko," it is made in two colours, white and pink, and the treatment is the same as for ordinary bromide paper; it can be enamelled in the same way and a fine matte surface can be produced by squeezing upon finely ground glass which has been cleaned and dusted with French chalk. The print must be backed. The surface of Nikko prints is rather delicate and scratches must be avoided; they can be removed by carefully rubbing the dry print with water and cotton wool. Sepia tones can be produced on bromide prints by immersing the dry print in the following bath :—

Hypo .. 10 ounces
Alum .. 1 ounce
Water .. 70 ounces
} Heat to 110 Fahr. (about).

This solution looks like milk and smells strongly of burning sulphur, and therefore the operation should be carried on out-of-doors; the prints should have been developed rather darker than usual, as they lose somewhat during toning.

The prints are immersed in the hot solution until the required tint is reached, this largely depends upon the quality of negative. After toning, the prints must be very well washed, and they can be matted or enamelled as above described. For mounting prints good cornflour or starch paste is to be recommended; to free from lumps squeeze through fine muslin. It is best to soak all the prints in plain water and place in a heap and paste each one as it is arrived at; this ensures getting the paste evenly applied, otherwise difficulty will be found in the "coming up" of the corners. Prints on Nikko paper can be toned as above and burnished in the ordinary way. Enlargements can be made upon transfer-type paper and transferred to any support, but I will give full directions for this process in a later number.

The Invention and Development of the Optical Lantern.

By EDWARD DUNMORE.

CHAPTER XVIII.

IMPROVING negatives is, without doubt, necessary in some degree with almost all, and in many cases very important ones can be so altered as to give excellent results in the resulting print. The simplest improvement is preventing the shadows printing too black and the light not sufficiently deep. We gum over the back of the negative a piece of tracing paper or papier mineral, which is more easily managed. When dry, with a sharp pen-knife cut round the edges of the denser parts, moisten the paper with a wet sponge and strip it off, leaving the thinner portions covered; more than one thickness of paper is sometimes required, or a little black-lead can be rubbed on the paper with a stump until sufficient density is gained. Another plan is to pour over the back of the negative ground glass varnish, which can be worked on with lead pencil for the same purpose; or covering the back with **spirit varnish** in which some aniline colour has been dissolved, and scraping it off where not required. This is a favourite method with many, and is perhaps the best. When treating portrait negatives, which require rather more delicate shading than landscape and architectural subjects, beautiful gradations may be made with this plan, so that it is impossible to detect on the print that the negative has had any doctoring whatever. Scraping the film with a sharp knife is used to reduce very high lights when small in size. Points of high lights occurring in deep shadows are picked out altogether, leaving only the bare glass. Accidents will occur occasionally, and negatives get scratched or broken, so that without some remedial treatment they are practically useless. If the glass is cracked and the gelatine film still uninjured, the best plan is to transfer the film on to another glass, which is easily done. Soak the broken negative in water, to which five or six drops of fluoric acid to the ounce has been added; this will have the effect of loosening the film, which will, with or without the help of a knife-point to the edges, easily leave the glass; when it is to be carefully removed to a dish of clean water. A perfectly clean piece of glass being in readiness, slip it into the water under the film, and spread it out with the finger tips level on the fresh plate right way up; lift out slowly the film and glass together, well drain, and after arranging the film smoothly on the support, set it up edgewise to dry, when it will be as good as it was originally.

But if both film and glass are broken, obtain a piece of glass the same size, warm it, and apply a little Canada balsam equally over the surface. Clean the back of the broken negative and lay it down on the balsamed glass, now made hot, and press into close contact, seeing that the broken edges are in close contact, then lay down on a perfectly level surface to cool and set. If any balsam has oozed up between the pieces it can be removed with a little turpentine and soft rag. Any chipped film is now retouched, and the negative is bound round with paper like a lantern slide. In printing, a piece of white paper must be laid over the frame, and then printed in the shade; this will prevent the crack showing, especially if the direction of the light is along and not across the crack. If a negative has only just began to show a crack, bind it round the edges to another piece of glass to prevent the extension of the fault, and **treat it tenderly** in printing. Damaged films are best restored by retouching. Patches of too little density can be rubbed over with the finger tip and a little blacklead. Patches of too great density can be rubbed carefully down with a soft pad moistened with spirits of wine. In cases of blurring and halation this abrasion will often be a great improvement. Pinholes and faults of this character are best touched out with a fine pointed sable brush and Indian-ink, taking care to keep the colour well within the defect; if clumsily done, and put on the film, the repair will be worse than the fault, as a white spot shows much more than a black one on the print.

Scratches and cracks on wet collodion plates are best remedied by rubbing them over with a pad of cotton wool charged with blacklead or fine lamp-black, which will fill all fine cracks and prevent them showing on the print, although they may appear very conspicuous on the negative. Defective skies are often best remedied by painting out altogether with Bates' black varnish or Gihon's opaque; if any objects project into the sky, as trees, towers, steeples, etc., it is better to paint carefully round their edges with Indian-ink, and then fill up the rest with black varnish, than to use the varnish altogether, as it is apt to run, and make defective outlines, while the water-colour will not. If the space to be filled be large, a print may be made and allowed to blacken, the sky part cut out and pasted on the back of the negative and the parts adjoining the subject painted out on the film. If there is insufficient sky space, a sufficient width of opaque paper can be added to it, shading during printing to prevent any hard line showing the junction of paper and negative, with clouds afterwards added.

Approximate English and French Weights and Measures.

Length.

1 MM. 0.001m = $\frac{1}{25}$ inch.
1 CM. 0·01m = $\frac{2}{5}$ inch.
1 DM. 0·1m = 4 inches.
1 Metre = 3·28 feet.

Weight.

1 Gramme = 15$\frac{1}{2}$ grains.
1 Kilo = 2$\frac{1}{5}$ pounds.

Capacity.

1 CC. = $\frac{1}{4}$ fluid drachm.
1 Litre = 1$\frac{3}{4}$ pints.
1 Litre = 61 cubic inches.

1 gramme = the weight of 1 cc. of water at 4°c = 39·2F.

Relationship between the Metrical System and English Weights and Measures.

A cubic foot of water measures 6$\frac{1}{4}$ gallons and weighs exactly 1,000 ounces. The same relationship therefore exists between the cubic foot and avoirdupois ounce as between the litre and the gramme. The usual tables giving the weight of the litre of a gas in terms of the gramme may be therefore read as English tables giving the weight of a cubic foot in terms of the avoirdupois ounce.

English Weights and Measures.

Apothecaries' Weight.

1 lb. = 12 ozs. = 96 drachms = 288 scruples = 5,760 grs.
1 oz. = 8 drachms = 24 scruples = 480 grs.
1 drachm = 3 scruples = 60 grs.
1 scruple = 20 grs.

Avoirdupois Weight.

1 lb. = 16 ozs. = 256 drachms = 7,000 grs.
1 oz. = 16 drachms = 437·5 grs.
1 drachm = 27·343 grs.

Chemicals are always purchased by avoirdupois weight, and usually compounded by apothecaries' weight. Gold, silver, and platinum by troy weight.

The Lanternist's Practical Cyclopædia.—No. XII.*

By CHARLES E. RENDLE.

Gas Bottle.—*See* Cylinders.

Gas Gauge.—A scientific device for testing the pressure of gas, an instrument that can be fixed to the nozzle of a gas-holder for ascertaining the quantity it contains.

Gas Governor.—A gas regulator.—*See* Regulators.

Gas Retort.—A vessel used for containing the material from which a gas is made.

Gelatine Lantern Slides.—Transparencies from drawings, plans, diagrams, rough sketches, conundrums, *bon mots*, etc., can be made in the simplest possible manner on sheets of colourless gelatine. Tracings are managed in the same way as with drawings, using the clear gelatine in place of the usual tracing paper, and a fine steel point in place of the lead pencil. When a tracing has been made in this way, the finger, or some such soft wad, may be dipped in finely powdered vegetable black, and the lines gone over; the superfluous powder can then be dusted off, when a fac-simile of the original should be the result. They are then tightly bound between two cover glasses. Transparent colours specially prepared for lantern slide purposes can also be profitably employed in this way.

Generator.—That which generates or produces. Those parts and vessels of the lanternist's apparatus used principally for generating the gases.

Georama.—A complete geographical panorama or view of the earth's surface.

Gesture.—To give expressions of the sentiments and passions by action of the limbs, attitudes of the body, etc.—*See* Elocution.

Ghost Effects —More ghost effects have successfully been carried out by the aid of optical lanterns than by any other means. A bi-unial or pair of lanterns are essentially the apparatus for the purpose, and readers are referred to the articles, "Dissolving Views" and "Effect Slides," both of which apply directly to the above heading.

Gold Chloride.—Into a phial containing nitric acid one part, and hydrochloric acid three parts—say together four drachms—drop 24 grains of fine gold, which can be purchased at any refiners. The phial can be suspended in a small vessel containing water, to which may be applied gentle heat by the aid of a spirit flame. As the temperature rises, chemical action sets up, and the gold quickly dissolves. Should any remain, however, after the action has ceased, more acid can be added in like proportions, and heat again applied till all traces of gold has disappeared. Any precipitate that may have formed should be filtered out. A saturated solution of ferrous sulphate is next prepared (iron one part, water seven parts), and added to the gold solution. The gold will fall as a metallic deposit, leaving the copper in solution. When well settled, the clear solution should be poured off, and water added repeatedly and drained off till no trace of the acid remains; this must be tested for by means of blue litmus paper, which will turn pink so long as the liquid is acidulated. For gold tri-chloride, the metallic gold must be redissolved by repeating the foregoing process, after which it is evaporated to dryness. This is best done by placing a dish containing the gold over a sand-or water bath, which should not exceed 208 degrees Fahr. The substance thus formed is gold chloride, fully purified, or commercially known as tri-chloride of gold. For convenience it should be dissolved in distilled water, one drachm to each grain of gold salt. And as the salt will weigh about half as much again as the original gold dissolved, 4½ ozs. of water should be allowed for the above quantity, and the bottle labelled "Gold Tri-chloride, one grain to the drachm." This solution will keep for an indefinite period.

Guide.—A conductor, one who superintends, an instructor, etc. Panoramas and dioramas of any magnitude term the spokesman "a guide," which appellation would certainly be more in truth and keeping with most other pictorial exhibitions, whose so-called lecturer has nothing whatever to do with the preparation of any of the literary matter.

Gridiron Saturator.—A trade name, or term given to one of the saturators of the higher order, and which has gained some notoriety, owing, no doubt, to the brilliant results that can be obtained.—*See* Saturators.

Grooved Boxes.—Boxes conveniently constructed for storing and conveying slides. These are made in many sizes, to hold from half-a-dozen to two or three hundred.

Hand Cameras.—A small and convenient form of camera much used for travelling purposes, and generally constructed with an automatic arrangement for changing the plates. The hand camera is specially adapted for obtaining lantern slides.—*See* Camera.

Heat, or Caloric caused by the subtle elements, and mostly accepted as a form of energy. Everything we see, or that can be seen or touched in this world contains heat, and were it withdrawn the whole of the animal and vegetable kingdoms would at once end in universal death. It is a common fact, that should a man live for one hundred years, his body has not been destitute of heat for one single minute during the whole of that long period. Heat is one of the many branches of chemical science, and unless made the subject of special study, its importance collectively cannot be appreciated. Among the many effects of heat, it may be mentioned that it penetrates everything that it comes in contact with, until an equilibrium of temperature be arrived at, and bearing in mind that most bodies expand by heat, lanternists will know that it is this expansion that is provided for in the lens cells, by the lens fitting loosely in its mount, thus guarding against accidents.

Helioscopic Lantern.—A trade term given to a make of single lantern, by a London manufacturer, and may be described to infer—As light from the sun's centre.

High Pressure Gauge.—A gauge for screwing into the nozzle of a cylinder containing gas under high-pressure, for the purpose of ascertaining the exact quantity therein.

Hill Norris Plates.—*See* Collodion Plates.

Hissing Jets.—The causes of the disagreeable sounds occasionally made by the jet, can, as a rule, be easily traced. Too great a pressure of oxygen; a chink in the rubber tube; or a faulty nipple are frequently accountable. When the pressure of oxygen has been reduced without effect, it is best to turn off the gas, disconnect jet, and examine it. A brush oftentimes removes small particles of dust, which will cause the nuisance.

Horizon.—Both in astronomy and geography, the horizon line is that line of demarkation where the sky appears to meet the earth. This is known as the sensible horizon, and is best viewed at sunrise or sunset on flat country or coast, or best of all from an altitude. It is the horizon line that colourists of transparencies make many beautiful effects from. There are also the true or astronomical horizon, and the artificial horizon, the latter being an instrument used in astronomical research.

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HUMOROUS SLIDES.—*See* Comic Slides.

HYDROCARBONS.—Compounds of carbon with hydrogen. Some are found in their natural state, whilst many are prepared artificially.

HYDROCHLORIC ACID GAS.—A colourless, irritating gas, composed in equal volumes of hydrogen and chlorine, or, if by weight, hydrogen 1 part, chlorine 35 to 36 parts. It is largely used in all laboratories, the arts and manufactures, and not infrequently in households as a cleanser of earthenware. As a by-product it is obtained in large quantities in the preparation of salt cake, by the action of vitriol or common salt (sodium chloride), hence the term, spirits of salts.

(*To be continued.*)

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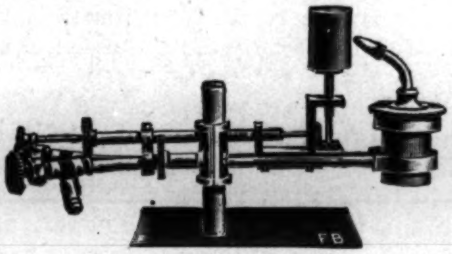
NEW APPARATUS.

CINEMATOGRAPH FILM SLIDES.

There need be no difficulty in any exhibitor procuring almost any subject desired for projection with the cinematograph if he visits Mr. Philipp Wolff of 9, Southampton Street, Holborn, for he is constantly adding to his immense stock. In his Series A are several very humorous sets, assaults at arms between champions, and also 12 sets of scenes of the Life of Christ. In Series B we find 8 sets cartoonists, several of Robert Houdin's clever tricks, and several exciting pictures, also scenes in the Græco-Turkish war. Series C consists of the Lumiere films, and Series D includes nearly 150 sets of such pictures as: A lover's scene—Rag pickers at work—Card party—Masons at work—Czar in Paris—Discharging a ship—A dance—Switchback—Riding on a donkey, etc. The films average 70 feet in length, and any set may be had coloured. Mr. Wolff has also perfected a projecting apparatus for films; this he terms the Vitaphotoscope, it is made entirely of metal.

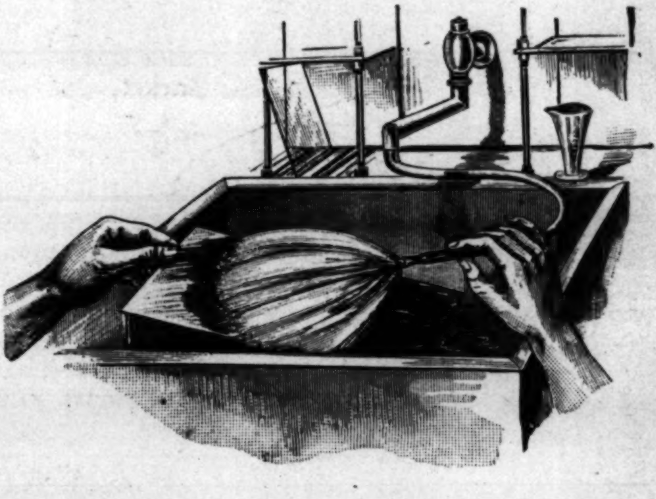
THE F.B. JET.

A powerful jet which will be useful in connection with cinematograph work, has been devised by Mr. F. Brown, of 13, Gate Street, High Holborn. The tray pin is made of stout metal and on this the jet is clamped, so that it is practically balanced as shown in the illustration, and the taps are of the screw-down pattern. This jet is capable of giving an intense light.



WATER BRUSH.

The British-American Ball Nozzle Company have placed on the market a new form of nozzle for effectively spraying water on films, plates, etc. The water issues in a continuous cone, and falls with great softness, so that there is no fear of injury to the most delicate film. When washing a plate with this appliance, the water may be driven off the edges of the plate in all directions. One mode of use will be seen in the accompanying sketch. These nozzles may be obtained for 2s. 6d., from the manufacturers, 3, Farringdon Avenue, E.C.

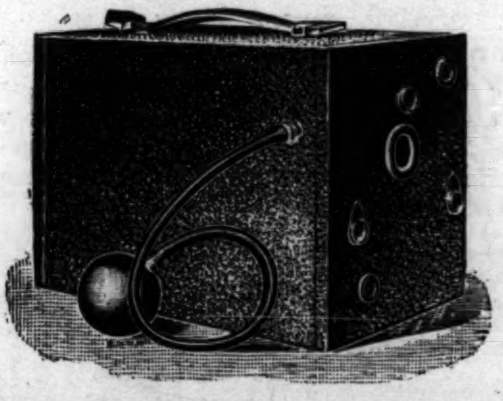


BAMFORTH'S SLIDES.

Mr. Jas. Bamforth, of Holmfirth, has sent us samples from the sets of slides he is issuing this season. These are made on collodion, are very clear in the high lights, and of a good colour throughout. His life model slides are carefully posed, and the character of each part seems to be thoroughly studied by the model. Readers will do well to send for his complete lists from his studios at Station Road, Holmfirth.

THE "PNEU" HAND CAMERA.

We have for a short time past had the opportunity of using the "Pneu" hand camera, which is the invention of Mr. F. W. Hudlass, of 13, Hartwood Road, Southport. With it negatives can be exposed, and plates changed in a very easy and automatic manner. Twelve plates in sheaths are placed in the back of the camera, and the pneumatic ball practically does everything else that is required. When it is squeezed it instantly brings a plate to the exact focal plane and releases the shutter, and the act of releasing the pressure on the ball causes the plate which has been exposed to fall forward, and another to take its place. In this manner it is impossible to expose one plate a second time, no matter how careless one may be. At the time of changing the plate a small index exhibits its number. The shutter can be set for either time or instantaneous exposure, and the lens is fitted with three sizes of stops. The camera is well made, covered with morocco, and is sold at the very moderate price of £2 2s.

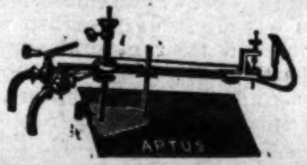


THE "PERFECT" PATENT ACETYLENE BURNER.

Having received one of these burners from Mr. Charles E. Talbot, of 19, Castle Street, Liverpool, we have been burning acetylene gas through it for several days, and find it not only economical, but it also gives a very pure light. The particular burner we received was hardly so much adapted for lantern work as for general illumination—although we understand they are being adapted for the former. The burner is so formed that two fine streams of gas impinge together and form a bright, flat flame. The gas issues from glass tubes, and the orifice is not much larger than a hair. The burner is both ingenious and good.

"APTUS" CENTERING JET.

A new jet tray of simple design has been brought out by Messrs. Sharp and Hitchmough. From the illustration it will be seen that the raising and lowering is performed by rotating a milled head, which travels on a screw standard, whilst the side adjustments are made by a sliding movement at the base of the tray itself.



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PATENT INTELLIGENCE.

The following List, relating to current Patent Applications, is compiled expressly for the "Optical Magic Lantern Journal" by W. P. Thompson & Co., Patent Agents, of 322, High Holborn, London, W.C., to whom all enquiries for further information should be addressed.

No.	Recent Patent Applications.
18890.	16th August, 1897. W. Scorer. Improvements in and connected with machines for taking, printing, and projecting photographs in rapid succession of flexible films of moving objects, and perforating.
18907.	16th August, 1897. A. Denich. Portable apparatus for producing acetylene gas.
18925.	16th August, 1897. R. J. Moss. An improved gas jet for magic lantern and similar exhibitive purposes.
19158.	19th August, 1897. S. L. Young. Improvements in or relating to magic lanterns and the like.
19278.	20th August, 1897. W. J. H. Jones. Improvements in the production and reproduction of animated photographs. Complete.
19805.	28th August, 1897. C. R. Neve. An improved apparatus for the taking and exhibiting of animated pictures.
20150.	2nd September, 1897. H. Kinsey and A. Millard. Improvements in apparatus for photographing objects and exhibiting moving pictures.
20296.	3rd September, 1897. Haydon, Urry, Ltd., and G. Haydon. Improvements in and relating to apparatus for obtaining and displaying kinematographic or zœtropic pictures.
20381.	4th September, 1897. J. A. Sinclair and E. R. Powell. Improvements in means of apparatus for use in the production, storing, and cooling of acetylene gas.
20537.	7th September, 1897. F. Windham and E. Fry. Portable lamp for producing gas from carbide of calcium.
20616.	9th September, 1897. H. Binard. New or improved diorama. Complete.
20936.	11th September, 1897. E. Kronke. Mechanism for hand camera for producing pictures in series.

Specifications Published.

Copies of the following specifications may be obtained by remitting 1/- for each specification to W. P. Thompson & Co., Patent Agents, 322, High Holborn, London, W.C.

22707 of 1896. Newman and Newman and Gaurdia, Limited. Kinematograph apparatus.
23683 of 1896. Moberly. Lamp or lantern for photographic purposes.
24412 of 1896. Smith. Optical lantern.
14883 of 1897. Oldfield and Oldfield. Magic lanterns and lamps for same.
17098 of 1897. Hastings. Optical "erecting" apparatus.
952 of 1897. Royle and Wynne. Optical toy.
12911 of 1897. Campbell. Kinetoscopes and means for observing objects and machinery in motion.
17021 of 1897. Godin. Acetylene gas generators.
13769 of 1897. Davidson. Mounting for lenses.
16975 of 1897. Marks (Bowers). Acetylene gas apparatus.

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Correspondence.

EXPERIENCES IN CONNECTION WITH HIRING LANTERN SLIDES.

To the Editor.

Sir,—You have allowed me before to mention some of my unfortunate experiences in hiring lantern slides; may I mention another? Some time previous to the Jubilee Day, I wrote to one of the dealers in lantern requisites—one whose establishment has been highly commended in your columns—asking whether I could hire a set of slides, illustrating the sixty years of Her Majesty's reign, for exhibition on Jubilee Day; and I received a reply in the affirmative, stating that a new set was in course of preparation, and that although a lecture upon it would not be ready, about 60 of the slides would be ready by that date. I duly engaged them, and fully anticipating that all would be right, I announced and prepared for a special exhibition. I also requested that a cylinder of *hydrogen* should be sent to me at the same time as the slides. (I always keep a cylinder of oxygen ready for use by me.)

The day arrived, also the cylinder and the slides; but, oh dear! the cylinder contained *oxygen*, not hydrogen, and the slides! how shall I describe them? The veriest tyro of an exhibitioner might well be ashamed to exhibit them. Some of them were scratched copies — or attempted copies—of old prints, several of them were duplicates, some were cracked, and the whole set was evidently an old attempt to illustrate, not the Jubilee of the present year, but the Jubilee of 1887. What was to be done? Fortunately, I had a tolerably numerous stock of really good slides in hand, and I was able to make a selection from them sufficiently appropriate I think to satisfy my audience; but I do not know otherwise what I should have done.

I returned the hired slides pretty quickly, and paid the full charge for them; but although I strongly remonstrated with the dealer, and ventured to inform him that I was no novice in lantern exhibitions, and that I very much objected to be treated in such a way, not a word of apology was made. Perhaps the fact of my having recently changed my residence, and consequently my address being in the country, made the dealer at first imagine that I was a country bumpkin who knew nothing about lantern slides. But it is very vexing to be treated in such a way, and to any person whose public reputation is of importance, it might be a serious matter.

I will not mention the name of the dealer, for I have no wish to injure him; and perhaps the whole proceeding was the work of some incompetent or careless assistant, whilst the master knew nothing about it.

No more hiring of slides for me; and yet this is a pity, because slides accumulate so uselessly by purchase, and it would really be a great convenience to be able to hire them in an assured and satisfactory manner.

D. A. DOUDNEY.

FREE LANTERN LECTURES FOR THE PEOPLE.

To the Editor.

Sir,—Last year you were kind enough to allow us through your columns to draw the attention of your readers to the two lantern lectures issued by us for the purpose of providing an enjoyable evening's entertainment for the people during the winter months.

The titles of these two lectures are respectively "Behind the Scenes of Popular Journalism" and "Popular Authors and Their Work," and they are full of interesting and entertaining information upon the subjects dealt with.

We found them last year very highly appreciated by many religious, philanthropic, and literary societies, Y.M.C.A.'s, and Board and National schools, and that being the case we shall have much pleasure in lending a copy of the lecture and a set of slides to any duly authenticated association which will undertake the payment of the small charge made for carriage. This sum is generally 1s. 6d., and rarely, if ever, exceeds 2s. 6d.

Should any reader of your paper desire any further information with regard to these lectures, we shall be pleased to supply him with copies of conditions, etc., on receipt of stamped addressed envelope.

Yours faithfully,
GEORGE NEWNES, Ltd.

Southampton-street, Strand.

PROFESSOR MALDEN'S EFFECT SLIDES.

To the Editor.

Sir,—I have noticed under the head of Correspondence a letter written by Mr. B. J. Malden, which appears in the September issue of the Optical Lantern Journal, and is calculated to do me great injury and injustice if allowed to pass without comment. I therefore hope you will grant me a little space for an explanation. I think if you, Sir, will carefully read the version of the interview, you will find I make no claim whatever of having had any experience with high-class triple limelight apparatus previous to 1874; but on the contrary, most clearly indicated that my experiences had been with magic lanterns only.

I think I have also most fully acknowledged my indebtedness to Mr. Malden in the general term of "able coaching," which of course is understood to mean general instruction, without going into all the details. With reference to his triple lantern, I quoted from memory, and am still under the impression that Mr. Malden's testimonial to Mr. Steward contained words to the effect "You have carried out my suggestions—instructions"; which is pretty much one and the same thing, and at most is a very trivial matter. Mr. Malden may perhaps pardon me for any slight error (if any) after twenty-three years of busy lantern work.

With regard to the effects, I spoke of four only, viz., The trains, shell effect, strobic circle, and lightning slides. I can perhaps assist Mr. Malden's memory in connection with the shell slide by repeating his remark made at the time I had the slide in hand—"You will not succeed in making the shell in its flight describe an arc." This at once precludes the possibility of his having either given me instruction or drawings. As a matter of fact, it was made, like several little mechanical appliances, quite in a voluntary way; simply for the love of the thing, and to see our show foremost and unequalled. The train slide Mr. Malden admits *is my idea*, and the most ridiculous part of the emphatic denial is the fact that the strobic circle and lightning slides were *my own property*, and never used by Mr. Malden. They were made at my house in my own leisure time.

In giving the details at the interview I was careful to be honest, and can very well afford to dispense with anything not really and rightfully my own. I will not go to the extent of saying Mr. Malden is a perverter of the truth, as he practically does me, but prefer to attribute the blunder to the vagaries of an imperfect memory or over-eagerness to claim the credit of everything. I am quite content to leave the verdict to any impartial reader of my lantern career, who will have, I am sure, no difficulty in marking the very evident truth which stamps every line of it. My motto is "High efficiency and no misrepresentation."

Yours faithfully,

C. W. LOCKE.

September 15th.

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Notes and Queries.

W. M. Barrett.—For your screen try whitewash containing a little blue and size. If the paint with which you coated it is still on, you might try giving it a coating of printer's varnish, and then rubbing over it finely powdered aluminium, such as printers employ for giving silver borders to cards, etc. To do this put on a woollen glove and dip the palm into the powder, then rub it gently over the screen.

T. Newton asks what focus of lens is required to give a disc of 20 feet diameter, the distance between the lantern and screen being 84 feet? *Ans.*—A lens of 12 inches focus should be used.

Albert, Hanson, Anxious, Subscriber, Lanternist.—You will find articles devoted to the subjects about which you enquire in our ANNUAL, which will be published within a few days of the appearance of this.

Fred Coombs (Adelaide).—Immediately on receipt of your letter we sent to the address mentioned to make some enquiries. The shop was empty and has been to let for the past six months. It was a milk shop, and the advertiser merely had his letters addressed to its care. From a neighbour we learned that numerous complaints had been made, not only in respect to this subject, but many others, and it was presumed the advertiser had been taken to task. We should be pleased to arrange any small purchase for you at any time.

P. Newland (Perth, W.A.).—Thanks for your long letter; it is gratifying to learn that so many people have the reading of your copy of this journal. We will endeavour, as far as possible, to give the question, but often this is impossible as sometimes they occupy two or three pages of note-paper, and are hedged round by certain circumstances or conditions. We quite agree that it would be a great benefit, especially to readers at a distance, if advertisers would all state their prices in their advertisements. We have mentioned this to several, but apparently they think their method the best. We have no opinion to offer about the apparatus you mention as we have not seen it in its present form, neither do we know anyone who has. Try the Stocks' lamp; you will, however, find the light from acetylene superior. We have dealt with the other portions of your letter in an article.

W. H. Mathieson.—Nothing can be done, as the acetylene firm has gone, and left no address. We had a letter from your agents and notified them to this effect.

J. P. Lewis.—You will find glass coated with the Dalton cold lacquers as good as any for limelight boxes.

Thos. Hughes.—If you consult this journal for September, 1896, p. 138, you will find the information desired about opaque screen.—In future address editorial communications to us (J. Hay Taylor) and not to the publishing department. It was owing to this that your query was omitted from last journal.

A. B. C.—We know no of means of disguising the smell of ether, nor of preventing it in time from percolating rubber tubbing. Ether requires that all the joints in a saturator should be *absolutely* tight. (2) It is quite evident that there was moisture inside the tin of limes, else they would have kept. You might coat each lime with paraffin wax. (3) Your query about the screen and the holdfasts is not sufficiently explicit for us to gather your meaning. If you will write again, explaining the matter more fully, we will endeavour to assist you to surmount the difficulty.

A Bidefordian.—The inventor of the Fantoccini slides is Mr. W. Cheffins, of Holbeach. Write him and explain your wants, he is particularly painstaking. Keevil's in our next.

W. Smart.—We do not know whether Mr. Norton is still open to supply apparatus, as we understand most of his time is occupied in giving cinematographic exhibitions, but you might enquire. His address is 38, Marchmont Street, Russell Square, London, W.C.

Generator.—You can make your mind quite easy about the new form of generator as supplied by Messrs. Thorne and Hoddle. The safety valve is simple and efficacious, and we see no reason why they should not be able to provide their old form of generator with this valve; in fact, we are under the impression that at a recent interview they informed us that they were prepared to add this to their old form. Have you asked them the question?

Gabriel Dyson.—The Lantern Society which used to meet at Hanover Square, W., died a natural death several months ago.